

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 5  
LAND AND CHEMICALS DIVISION, RCRA BRANCH  
77 W. JACKSON BOULEVARD  
CHICAGO, IL 60604

COMPLIANCE EVALUATION INSPECTION REPORT

**INSTALLATION NAME:** Equistar Chemicals, LP

**EPA ID No.:** ILD 048 296 180

**LOCATION ADDRESS:** 8805 North Tabler Road  
Morris, Illinois 60450

**NAICS CODE(s):** 325110 [Petrochemical Manufacturing]  
325211 [Plastics Material and Resin Manufacturing]

**DATE OF INSPECTION:** May 31, 2017 – June 1, 2017

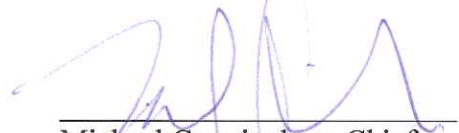
**U.S. EPA INSPECTOR(s):** Graciela Scambiatterra

**PREPARED BY:**

  
Graciela Scambiatterra  
Environmental Scientist

10/19/2017  
Date

**APPROVED BY:**

  
Michael Cunningham, Chief  
Compliance Section 1  
RCRA Branch  
Land and Chemicals Division

10/17/17  
Date

## **RCRA Compliance Evaluation Inspection**

### **Introduction**

I, Graciela Scambiaterra, Environmental Scientist, from the United States Environmental Protection Agency (EPA) conducted a hazardous waste focused compliance inspection (FCI) at Equistar Chemicals, LP (Equistar), located at 8805 N. Tabler Road, Morris, Illinois. The Purpose of the FCI was to evaluate Equistar's compliance with certain provisions of the Resource Conservation and Recovery Act (RCRA), specifically, those regulations related to air emissions from the storage of hazardous waste. I was joined by Katharina Bellairs, Environmental Engineer, from EPA.

Photographs (photos) taken during the inspection are included in Attachment 1.  
Documents obtained during the inspection are annotated in Attachment 2.

### **DAY 1: May 31, 2017**

#### **History and Interview**

We arrived at Equistar on May 31, 2017 at approximately 8:45 a.m., at the guard/security check-in area. We identified ourselves and provided our credentials to the security personnel. We watched a short safety video, took a visitor assessment and were then issued visitor badges for the day. Marcus Hatch met us at the security area and escorted us to the Administrative Building where we conducted the opening interview. The following individuals were present during the FCI:

<b>NAME</b>	<b>TITLE</b>	<b>EMPLOYER</b>
Gracie Scambiaterra	Environmental Scientist	U.S. EPA
Katharina Bellairs	Environmental Engineer	U.S. EPA
Robert Steele	HSE Manager	Equistar
Marcus Hatch	Environmental Engineer	Equistar
Jeff Popidinski	Environmental Technician	Equistar
Ross Hubbard	Environmental Engineer	Equistar

Once we were in the office area, we held an opening conference with all the individuals named above. We explained to the Facility representatives the purpose for being at the facility; and that we would be performing a records review and a physical site inspection of the facility, including taking photographs. The discussion included confidential business information (CBI). I informed the Facility representatives that if they or any other Facility employees were going to disclose CBI, I should be informed immediately in order for me to handle that material and/or information in accordance with EPA policy.

The Equistar representatives provided a brief history of the facility. Equistar has been operating at this location since approximately 1998, although operations began in 1969 under different ownership. Equistar was purchased by Lyondell Basell in 2007 and is the

current owner. Equistar operates on a 24/7 basis, employs approximately 308 fulltime personnel at this location and has approximately 100 contractors operating onsite.

Equistar applied for a Part A permit on or about November 18, 1980. The original Part B permit was effective on September 29, 1988. Equistar is permitted as a Storage Facility and does not receive waste from off-site generators. They are permitted to store a capacity of 14,080 gallons of RCRA-related waste. Based on the EPA internal database, RCRAInfo, the Part B permit has an expiration date of September 1, 2021.

Equistar had operated an approved Incinerator in 1996, which it then closed in 1998. In addition, they had operated a surface impoundment on-site, which then closed approximately in 1991.

Equistar currently stores hazardous waste in containers and in tanks. They also operate an on-site wastewater treatment plant (WWTP), which treats oily water. Equistar has a storm water permit and a NPDES discharge permit, allowing them to discharge into the Illinois River.

#### Process Description:

Equistar has two main manufacturing areas, the ethylene manufacturing side (west side) and the propylene manufacturing side (east side). Ethane and propane gases are brought in to the facility, via pipeline, railcar or shipped by truck. The ethane and propane are used in the west side to start the manufacturing of ethylene.

The west side area contains 14 furnaces (Lummus), of which ten are SRT1 furnaces and four are SRT4 furnaces. SRT4 furnaces have a higher capacity and shorter residence time than the SRT1 furnaces, however, the total time in any of the furnaces is less than a second. In addition, the SRT4 furnace has the capability of making steam, that is required in the manufacturing process. The ethane and propane are cracked in these furnaces, which starts the manufacturing process. The focus is on ethylene manufacturing, therefore, ethane is ideal. Propane and butane are used in the manufacturing of ethylene, however, ethane is preferred.

Approximately 30% of the wet portion of the gas is ethane and heavier. Approximately 60-70% is converted to ethylene and the other 30-40% will be made up of propylene and butadiene. Butadiene is shipped to Equistar's southern location. Equistar uses the derivatives off the other end to make other products, such as pellets, that will go offsite as product.

Equistar has four LDPE (low-density polyethylene) lines and two LLDPE (linear low-density polyethylene) lines. LDPE are higher pressure and LLDPE are lower pressure (higher tensile strength) lines. The ethylene products include ethylene and propylene that are used internally at the facility. The LDPE products include injection and film. The LLDPE products include rotomolding, wire and cable, injection and automotive products.

Ethylene manufacturing is the beginning of the process. Ethane and propane are cracked in furnaces/reactors at approximately 1600°F and converted to olefins. During the cooling process, quench towers are used to recover hydrocarbons as soon as they exit the furnaces. Heavier hydrocarbons are knocked out of the system (pentane (C5) and heavier). Process dryers are then used to solidify the C3 (propane) and C4 (butane) hydrocarbons. The de-methanizing and de-ethanizing process also knocks out heavier hydrocarbons. A caustic wash consisting of 2% sodium hydroxide (NaOH) is used to take out the impurities of the hydrocarbons coming out of the furnaces, such as sulfur. Approximately 12-15 gallons per minute of the caustic wash are sent through a coalescer, which separates the heavy and light oil that the water picks up during the wash process. The spent caustic wash is sent to the on-site WWTP. A benzene recovery/steam stripper is used and the waste is stored in a tank FA-125. What is not contained from the benzene stripper is sent to one of the onsite flares. Several of the processes at the facility have the capability to be sent continuously to a flare, while most have an intermittent connection.

Equistar undergoes the de-coking process about every 30-180 days (as needed) for its furnaces. The process includes running steam to clean the furnace and oxygen to start the burning process while the furnace remains on. The process is particulate-controlled and testing is done for metals.

The furnaces at Equistar primarily run on hydrogen off-gases from the de-methanizing process. However, some natural gas is brought in as a supplement for the operation of the furnaces. CoGen, an onsite contractor, provides most of the process steam for the facility processes. Equistar's onsite WWTP is operated by the olefins unit. The WWTP generates a non-hazardous filtercake that is sent to a landfill in Ottawa, Illinois.

At approximately 12:30 p.m., we took a break for lunch and Ms. Bellairs and I departed the facility.

We returned to the office area at approximately 1:30 p.m. and prepared for the site inspection.

### **Site Inspection**

The Equistar physical site inspection began at approximately 2:00 p.m. in the Ethylene Control Room. Mr. Steele, Mr. Hatch, Mr. Popidinski and Mr. Hubbard accompanied Ms. Bellairs and me on the site inspection.

#### **Ethylene Manufacturing - West Side:**

The site inspection began in the ethylene control room. This area monitors the valves and pumps for the ethylene manufacturing process. Valves are monitored quarterly, pumps monthly, and difficult to monitor items are annually monitored. There are no process wastes (subject to 40 CFR 264, subpart AA), but there are tankers with waste and containers (subject to 40 CFR 264, subpart CC).

We walked around the west side area, up and down several levels, including the furnace area (*see* photos #1-2, overview of the west side). Within the west side, we inspected the caustic waste tank (FA-125), which is generated from the benzene stripper (*see* photos #3-5).

Before returning to the office, we drove through the ethylene tank farm area. Once we arrived back at the office area, I explained that I was concluding the inspection for the day. I also explained that Ms. Bellairs and I would return the following day at approximately 8:00 a.m. to complete the site inspection and conduct the records review. Ms. Bellairs and I left Equistar at approximately 4:00 p.m.

## **DAY 2: June 1, 2017**

I arrived the following day at Equistar at approximately 8:05 a.m., along with Ms. Bellairs.

Mr. Steele, Mr. Hatch, Mr. Popidinski and Mr. Hubbard met us in the office area. We asked about tank FA-125 (caustic waste tank) and we were informed that Test Method 21 (Determination of Volatile Organic Compound Leaks) is used for the monitoring of this tank. The caustic waste is sent offsite to Green America in Missouri.

We prepared to return to the physical site inspection.

### **Site Inspection (continued)**

Mr. Steele, Mr. Hatch, Mr. Popidinski and Mr. Hubbard accompanied Ms. Bellairs and me on the site inspection.

#### **Ethylene Manufacturing - West Side:**

We returned to the west side (ethylene manufacturing side); specifically, to the FA-125 tank area. We looked at the valves, flare header, and blowdown area. There are two blowdown streams here, one from the quench system, and the other from the benzene stripper. The blowdown water includes benzene at less than 10ppm concentration. Both blowdown streams are sent to the onsite WWTP for treatment.

#### **Polymer Manufacturing – East Side:**

The next area we inspected was the East Side (polymer manufacturing side) of the facility. Ethylene (from the West Side) is used in the East Side in the primary compressor. Once the ethylene is processed through various stages, including a hyper compressor, it will undergo processing in the reactor area, where it will be polymerized.

Also in this area, vinyl acetate (VA) is injected into one of the process lines (line 3) and into the primary compressor. Once the VA exits the compressor area, it's a hazardous waste. A VA knockout drum/vessel is used for the VA waste (*see* photos #6-8) prior to

being sent to a hazardous waste storage tank (see photos #9-11). The VA waste is offloaded from the hazardous waste storage tank onto tanker trucks at the offloading area (see photo #12).

Wastewater Treatment Plant (WWTP):

40 CFR 60, Subpart VV- Standards of Performance for Equipment Leaks of VOCs applies to the valves and pumps in the WWTP. We walked around the area and walked up to oversee the clarifier. The clarifier has an oil that is constantly being skimmed and ends up in the various sumps. I was informed that this oil is then pumped from the sumps into one of the four oil tanks (TK801-TK804).

We continued our walk around the WWTP and came upon the tank farm. I noticed one tank (TK802) labeled with the words "Hazardous Waste." I was informed that the tank is no longer in their facility RCRA permit and is currently only storing oil from the clarifier. Also in the area were three neutralization tanks (TK700-TK702) with spent caustic (1% NaOH) from the benzene stripper.

Container Storage/Handling Area:

The final area we inspected was the hazardous waste container storage area. I noted eleven containers of hazardous waste within the storage bays (see photo #13). The oldest container in storage was dated 1/17/2017. Mr. Popodisnki informed me that he conducts the weekly inspections of this area every Wednesday.

I concluded the Facility physical site inspection at approximately 11:30 a.m., at which time the Equistar representatives escorted us back to the office area.

At approximately 11:40 a.m., we took a break for lunch and Ms. Bellairs and I departed the facility.

We returned to the office area at approximately 12:40 p.m. and began the records review.

**Records Review**

I began the records review at approximately 1:00 p.m.

Manifests/LDRs

I reviewed the hazardous waste manifests beginning January 2014 until December 2016. I noted the following:

- VA waste (D001):
  - 2014: sent offsite to Green America Recycling (MOD054018288)
  - 2015: sent offsite to Green America Recycling (MOD054018288) and Systech (OHD005048947)

- 2016: sent offsite to Green America Recycling (MOD054018288) and Systech (OHD005048947)
- Tank TK802 waste (D018):
  - 2014: sent offsite to Green America Recycling (MOD054018288)
  - Last shipment was sent 7/8/2014
- Tank FA125 waste (D001, D018):
  - 2014: sent offsite to Green America Recycling (MOD054018288) and Systech (KSD980633259)
  - 2015: sent offsite to Green America Recycling (MOD054018288), Systech (KSD980633259) and Systech (OHD005048947)
  - 2016: sent offsite to Green America Recycling (MOD054018288)

### Annual Reports

Hazardous Waste Annual Report								
Calendar Year:		2016	Date Signed:		2/27/2017			
Certified Mail ReFCIpt: unknown								
Closure Cost Estimate: \$75,401								
Waste Streams Reported								
D018	D035	D001	D008	D039	D007	D011	D002	D003
F003								
Hazardous Waste Annual Report								
Calendar Year:		2015	Date Signed:		2/15/2016			
Certified Mail ReFCIpt: 7015 1730 0002 1192 5699								
Closure Cost Estimate: \$74,434								
Waste Streams Reported								
D018	F005	D001	D003	D039	D007	D011	D002	D008
F005	D035							
Hazardous Waste Annual Report								
Calendar Year:		2014	Date Signed:		2/17/2015			
Certified Mail ReFCIpt: 7014 1820 0001 5173 0813								
Closure Cost Estimate: \$73,690								
Waste Streams Reported								
D018	F005	D001	U154	D039	D007	D011	D002	D003
D008	D035							

I concluded the Equistar records review at approximately 3:45 p.m., at which time I prepared to conduct a closing conference.

### Closing Conference

I sat down with Mr. Popidinski, Mr. Hatch, Mr. Steele, Mr. Hubbard and Ms. Bellairs to discuss the records review and the site inspection. The following topics were discussed:

1. 2016 Annual Report: we discussed the discrepancy between the hazardous waste manifest for the de-propanizer waste (F005) and the reporting of this waste in the annual report (F003).

2. TK802: we discussed the tank and Equistar informed me that the tank was no longer listed in the RCRA permit.
3. CBI: we discussed that Equistar did not provide me with any CBI during the FCI.
4. Ms. Bellairs discussed with the facility representatives Test Method 8260 (Volatile Organ Compounds by Gas) for the caustic waste stream from the benzene stripper. Additional information will be provided to Ms. Bellairs on this testing.

I thanked the Equistar representatives for their time and the documents they provided me. I explained that a thorough review would be completed and a compliance determination would be forthcoming.

I completed the FCI at approximately 4:40 p.m. and departed the facility.

**ATTACHMENTS: (2)**

Attachment 1	Photographs taken during the inspection
Attachment 2	List of documents obtained during the FCI



## Attachment 2

Equistar Chemicals - RCRA FCI  
EPA ID Number: ILD 048 296 180  
May 31, 2017 – June 1, 2017



Photo 1. Photographer: G. Scambiatterra. Time: 2:25 p.m.  
Description: West Side, Ethylene Mfg. Furnaces.



Photo 2. Photographer: G. Scambiaterra. Time: 2:26 p.m.  
Description: West Side, Ethylene Mfg. C2 splitter (de-ethanizer), de-methanizer  
refrigeration unit.



Photo 3. Photographer: G. Scambiatterra. Time: 2:49 p.m.  
Description: West Side, FA125 tank.





Photo 4. Photographer: G. Scambiaterra. Time: 2:50 p.m.  
Description: West Side, FA125 tank.



Photo 5. Photographer: G. Scambiaterra. Time: 2:50 p.m.  
Description: West Side, FA125 tank.





Photo 6. Photographer: G. Scambiaterra. Time: 9:33 a.m.  
Description: East Side, Polymer mfg. VA knockout vessel.

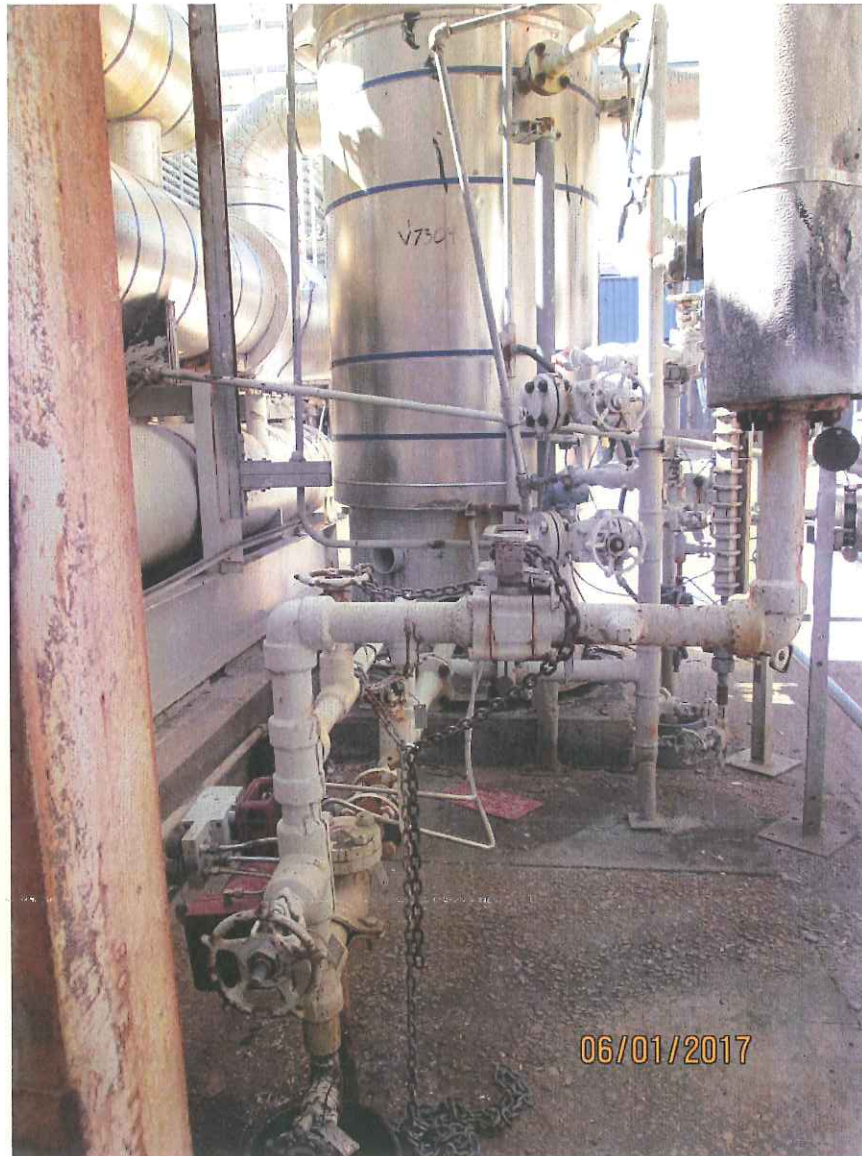


Photo 7. Photographer: G. Scambiaterra. Time: 9:34 a.m.  
Description: East Side, Polymer mfg. VA knockout vessel valves.





Photo 8. Photographer: K. Bellairs. Time: 9:35 a.m.  
Description: East Side, Polymer mfg. VA knockout vessel valves.





Photo 9. Photographer: G. Scambiaterra. Time: 9:40 a.m.  
Description: East Side, Polymer mfg. VA waste storage tank.

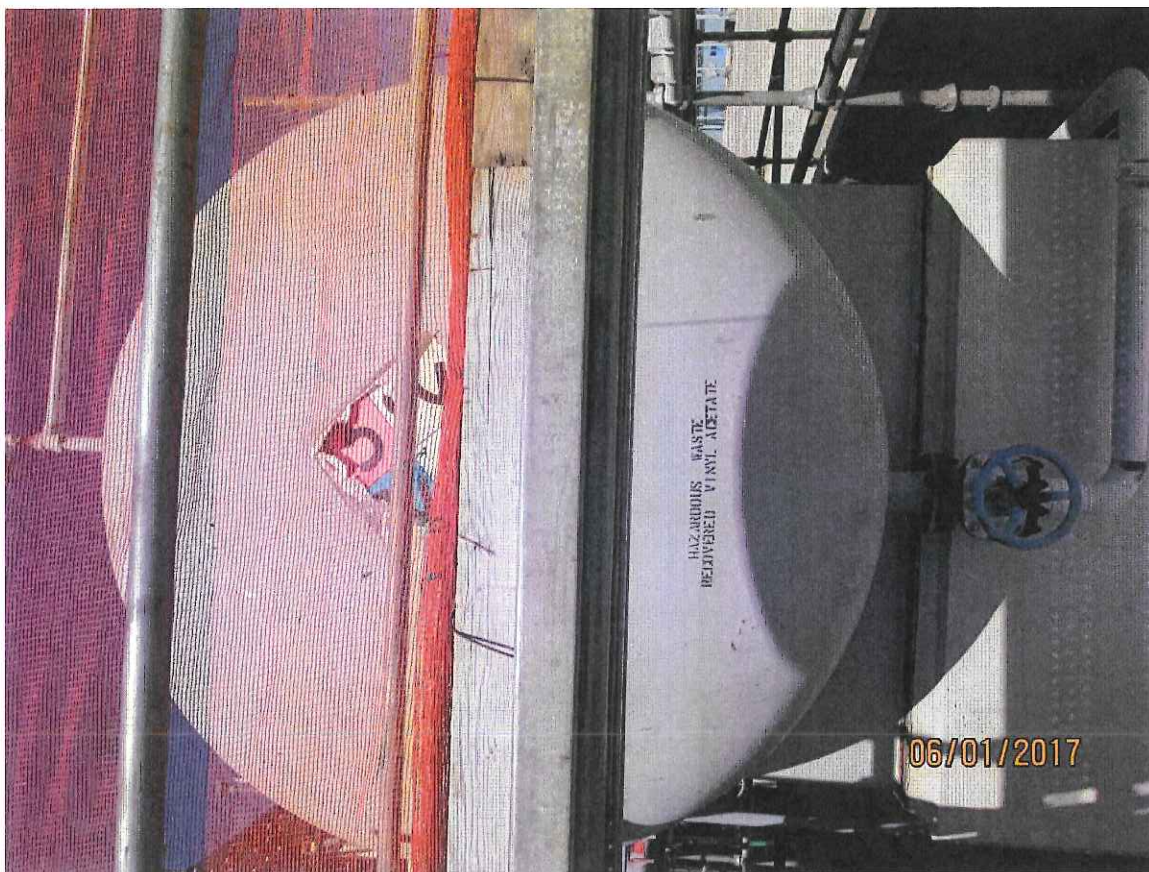


Photo 10. Photographer: G. Scambiaterra. Time: 9:41 a.m.  
Description: East Side, Polymer mfg. VA waste storage tank.





Photo 11. Photographer: G. Scambiaterra. Time: 9:41 a.m.  
Description: East Side, Polymer mfg. VA waste storage tank.

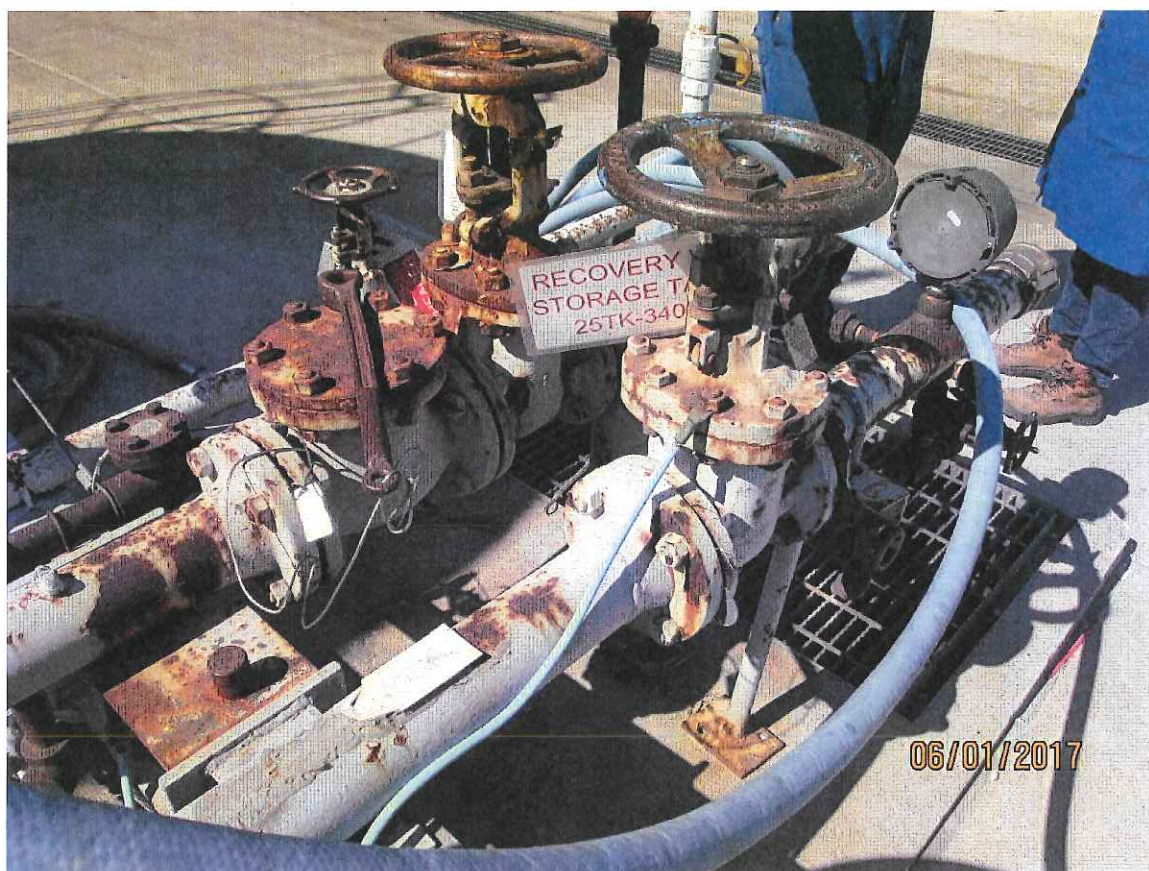


Photo 12. Photographer: G. Scambiaterra. Time: 9:44 a.m.  
Description: East Side, Polymer mfg. VA waste storage tank offloading area.





Photo 13. Photographer: G. Scambiaterra. Time: 11:21 a.m.  
Description: Container storage area/Handling Area. Containers of hazardous waste.

## Attachment 2

Equistar Chemicals - RCRA FCI  
EPA ID Number: ILD 048 296 180  
May 31, 2017 – June 1, 2017

Documents received during the inspection:

Document #	Description	Claimed as CBI
1	Facility diagram, dated 7/15/2016	No
2	Facility diagram with satellite and accumulation areas	No
3	WWTP diagram, dated 1/28/2014	No
4	RCRA permit, expiration date of 2/10/2010	No
5	Illinois EPA RCRA permit, expiration date of 9/1/2021	No
6	Manifest for VA, FA-125, FA-137, TK 802/804	No
7	Manifest report: 1/1/2014 - 12/31/2014	No
8	Manifest report: 1/1/2015 - 12/31/2016	No
9	Manifest report: 1/1/2016 - 12/31/2016	No